

Ocean Abundance Projections and Prospective Harvest Levels for Klamath River Fall Chinook, 2004 Season

Klamath River Technical Advisory Team
1 March 2004

Executive Summary

Predictor performance for 2003 and forecasts for 2004 are:

		2003			
	Age	Preseason	Postseason	Pre/Post	2004 Forecast
Ocean Abundance	3	171,300	478,117	0.36	72,100
	4	132,400	182,432	0.73	134,500
	5	6,500	1,901	3.42	9,700
Proportion Natural	3	0.46	0.56	0.82	0.55
	4	0.71	0.61	1.16	0.61
	5	0.69	0.84	0.82	0.71
Ocean Harvest Rate	4	0.160	0.206	0.78	---
Ocean Fall Harvest	3	---	0	---	---
	4	---	5,176	---	---
	5	---	2,570	---	---

The implications of the 2004 forecast ocean abundances, proportions natural, and the 2003 ocean fall harvest for fisheries management in 2004 were explored with the Klamath Ocean Harvest Model (KOHM) under three hypothetical management scenarios: (A) no ocean or river fisheries in 2004, (B) the 2003 ocean fishery seasons and quotas, a tribal allocation of 50% (of total harvest), and a river recreational allocation of 15% (of nontribal harvest), (C) same scenario as (B) except that the river recreational allocation was set at 11% to meet the floor spawning requirement. Under scenario (A), the KOHM forecasts 68,100 adults would return the basin to spawn in natural areas. The maximum permissible spawner reduction rate (SRR) of 2/3 would thus be expected to result in fewer than 35,000 naturally spawning adults. The SRR in 2004 must be less than 0.52 to yield at least 35,000 naturally spawning adults. Under scenario (B), the KOHM forecasts a spawning population of approximately 55,100 adults, of which 33,100 would be expected to spawn in natural areas. The total harvest projected under this scenario would be 65,500 adults (tribes 32,800; river recreational 4,900; ocean commercial 22,800; ocean recreational 5,100), with an age-four ocean harvest rate of 15.8%. Under scenario (C), the KOHM forecasts a spawning population of approximately 58,200 adults, of which 35,000 would be expected to spawn in natural areas. The total harvest projected under this scenario would be 62,600 adults (tribes 31,300; river recreational 3,400; ocean commercial 22,800; ocean recreational 5,100), with an age-four ocean harvest rate of 15.8%. These forecasts are provided for informational purposes only; the Pacific Fishery Management Council (PFMC) will adopt 2004 ocean salmon fishery management regulations in April, 2004.

Introduction

The PFMC's (1988) fishery management plan for Klamath River fall chinook (Amendment 9) permits a natural spawner reduction rate via fisheries of no more than 2/3, with a minimum escapement of 35,000 natural spawning adults (Prager and Mohr 2001). Naturally spawning adult fish are defined as age-three or older fall chinook that spawn outside of the hatchery environment, regardless of their origin. The KOHM is used by the PFMC to forecast the impacts of ocean and river fisheries on Klamath River fall chinook, and to evaluate whether a given management option is expected to meet the fishery management plan's biological goals for Klamath River fall chinook. The KOHM requires forecasts of Klamath River fall chinook ocean abundance and proportion of natural spawners by age, along with the estimated harvest of these fish in the previous calendar year's September through December (fall) ocean fisheries. This report presents these forecasts and estimates for the 2004 management year. For informational purposes, KOHM forecasts of harvest and spawner escapement are also presented under two hypothetical management scenarios: (1) no ocean or river fisheries, and (2) 2003 ocean and river fishery regulations. Historical records of ocean abundance, harvest, harvest rates, river escapement, and predictor performance are also compiled. These records differ from those presented in KRTAT reports issued prior to 2002 for reasons described in KRTAT (2002) and Goldwasser et al. (2001).

Data and Analytical Methods

The age-composition of the 2003 river run of Klamath River fall chinook salmon used in this report is from the KRTAT (2004), as are previous years' forecasts (KRTAT 2003) unless stated otherwise.

Ocean Abundance Forecast

The age-specific ocean abundance predictors are based on the use of "sibling regression". The age a September 1 ocean abundance estimates for brood years 1979–1999 were regressed against the age $a-1$ river run-size estimates of their respective cohorts (Table 1, Figure 1). By convention, September 1 is the date that immature Klamath River fall chinook remaining in the ocean are incremented one year in age. The regressions were fit using least-squares with the y-intercept constrained to zero, which gives the biologically reasonable expectation that an age $a-1$ river run-size of zero predicts an age a ocean abundance of zero. This procedure is consistent with recommendations of the PFMC's Salmon Technical Team (STT), and Scientific and Statistical Committee (SSC).

Ocean abundance has been forecast preseason since 1985 using methods similar to those described above (Tables 2 and 3). Postseason ocean abundance estimates were calculated using cohort reconstruction methods that accommodate spatial and/or temporal variations in maturity, straying, and fishery impact rates applied separately to the hatchery and natural components of the stock. The postseason estimates for 2002 (age-three) and 2003 (age-three, age-four) are preliminary, as their respective cohorts are incomplete (Table 1).

The 2003 age-three abundance forecast was 0.36 times its postseason estimate (Table 2). Preseason forecasts have underestimated age-three abundance in ten of the nineteen previous years, and have overestimated it in nine. The 2003 age-four abundance forecast was 0.73 times its postseason estimate (Table 2). Preseason forecasts have underestimated age-four abundance in eight of the nineteen previous years, and have overestimated it in eleven. The 2003 age-five abundance forecast was 3.42 times its postseason estimate (Table 2). Preseason forecasts have underestimated age-five abundance in ten of the seventeen previous years, and have overestimated it in seven.

Proportion of Natural Spawners Forecast

The age-specific proportion of natural spawners is also forecast using "sibling regression". In this case, the age a observed proportion natural for calendar years 1996–2003 were regressed against the age $a-1$ observed proportion natural of their respective cohorts (Table 4, Figure 2). Data for calendar years prior to 1996 were not used because: (1) at this time the hatcheries did not always have an "open-door" policy (some fish were

denied entry into the hatcheries and presumably spawned in natural areas); and (2) the proportion natural time-series (Figure 2a) indicates a “shift-point” near 1995–1996. The regressions were fit using ordinary least-squares for age-three and age-four. For age-five, the slope of the relationship was insignificant, and the arithmetic mean was used as the predictor.

The 2003 proportion natural forecast for age-three, -four, and -five fish was 0.46, 0.71, 0.69, respectively, and the corresponding post-season estimates are 0.56, 0.61, 0.84, respectively (Table 4).

Historical Harvest Levels and Rates

Historical (1986–2003) ocean and river harvest levels and rates of age-three and age-four Klamath River fall chinook are listed in Table 5. The 2003 age-four ocean harvest rate was forecasted to be 16.0% (STT 2003); its postseason estimate is 20.6% (preliminary).

2003 Ocean Fishery Fall Harvest

Klamath River fall chinook ocean harvests during the 2003 fall period are estimated postseason through expansion of the coded-wire tags (all release types) recovered in those fisheries. Each coded-wire tag recovery is expanded for sampling and mark-rate, and then to account for the harvest of natural-origin fish, further expanded by the estimated basin-wide escapement (hatchery- plus natural-origin) per hatchery-origin fish observed in the river run just prior to these fall fisheries (same brood and calendar year).

2004 Forecasts

The 2004 forecasts of ocean stock abundance and proportion natural fish are (Figures 1-2):

Age	Abundance	Proportion Natural
3	72,100	0.55
4	134,500	0.61
5	9,700	0.71
Total	216,300	

For the 2003 fall fisheries, the natural production multipliers for the coded-wire tag recoveries are

Age (a)	Total Escapement (a-1)	Hatchery-origin Escapement (a-1)	Natural-production Multiplier (a)
3	3,845	1,248	3.082
4	94,147	48,784	1.930
5	96,559	41,706	2.315

and the fishery-area-month-age-specific estimated harvests are presented in Table 6. These estimated fall landings will be accounted for in ocean fisheries harvest allocation in 2004, and the associated harvest impacts will be deducted from the September 1 ocean abundance forecasts.

Absent ocean and river fisheries in 2004, the KOHM forecasts 68,100 adults would return the basin to spawn in natural areas. The maximum permissible spawner reduction rate (SRR) of 2/3 would thus be expected to result in fewer than 35,000 naturally spawning adults. The SRR in 2004 must be less than 0.52 to yield at least 35,000 naturally spawning adults. For further details see Appendix A.

Under the 2003 ocean fishery seasons and quotas, a tribal allocation of 50% (of total harvest), and a river recreational allocation of 15% (of nontribal harvest), the KOHM forecasts a spawning population of approximately 55,100 adults, of which 33,100 would be expected to spawn in natural areas. The total harvest projected under this scenario would be 65,500 adults (tribes 32,800; river recreational 4,900; ocean

commercial 22,800; ocean recreational 5,100), with an age-four ocean harvest rate of 15.8%. For further details see Appendix B.

Under the 2003 ocean fishery seasons and quotas, a tribal allocation of 50% (of total harvest), and a river recreational allocation set at 11% to meet the floor spawning requirement, the KOHM forecasts a spawning population of approximately 58,200 adults, of which 35,000 would be expected to spawn in natural areas. The total harvest projected under this scenario would be 62,600 adults (tribes 31,300; river recreational 3,400; ocean commercial 22,800; ocean recreational 5,100), with an age-four ocean harvest rate of 15.8%. For further details see Appendix C.

These forecasts are provided for informational purposes only; the Pacific Fishery Management Council (PFMC) will adopt 2004 ocean salmon fishery management regulations in April, 2004.

Literature Cited

- Goldwasser, L., M. S. Mohr, A. M. Grover, and M. L. Palmer-Zwahlen. 2001. The supporting databases and biological analyses for the revision of the Klamath Ocean Harvest Model. Available from M. S. Mohr, National Marine Fisheries Service, 110 Shaffer Road, Santa Cruz, California, 95060.
- KRTAT (Klamath River Technical Advisory Team). 8 March 2002. Ocean abundance projections and prospective harvest levels for Klamath River fall chinook, 2002 season. Available from U.S. Fish and Wildlife Service, 1829 South Oregon Street, Yreka, California, 96097.
- KRTAT (Klamath River Technical Advisory Team). 2004. Klamath River fall chinook age-specific escapement, river harvest, and run size estimates, 2003 run. Available from U.S. Fish and Wildlife Service, 1829 South Oregon Street, Yreka, California, 96097.
- PFMC (Pacific Fishery Management Council). 1988. Ninth amendment to "The fishery management plan for commercial and recreational fisheries off the coasts of Washington, Oregon, and California commencing in 1978". Pacific Fishery Management Council, 7700 NE Ambassador Place, Suite 200, Portland, Oregon 97220.
- Prager, M. H., and M. S. Mohr. 2001. The harvest rate model for Klamath River fall chinook salmon, with management applications and comments on model development and documentation. North American Journal of Fisheries Management 21:533-547.
- STT (Salmon Technical Team). 2003. Preseason report III: Analysis of council adopted management measures for 2003 ocean salmon fisheries. Pacific Fishery Management Council, 7700 NE Ambassador Place, Suite 200, Portland, Oregon 97220.

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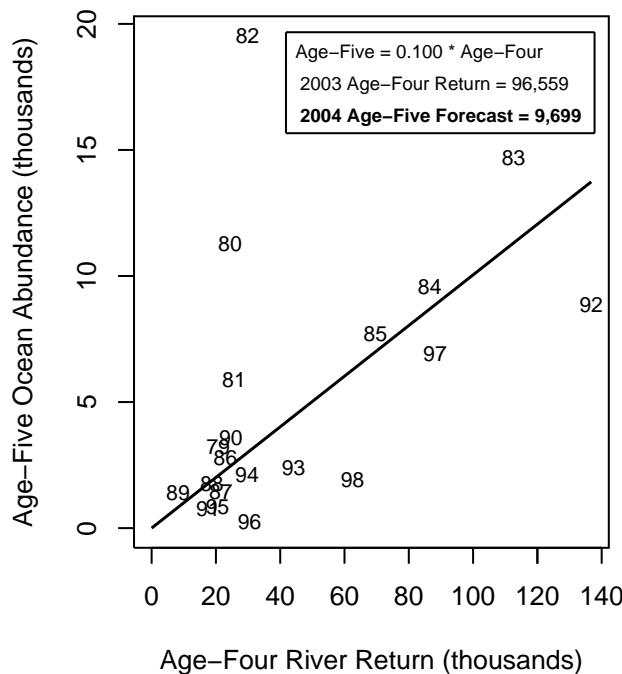
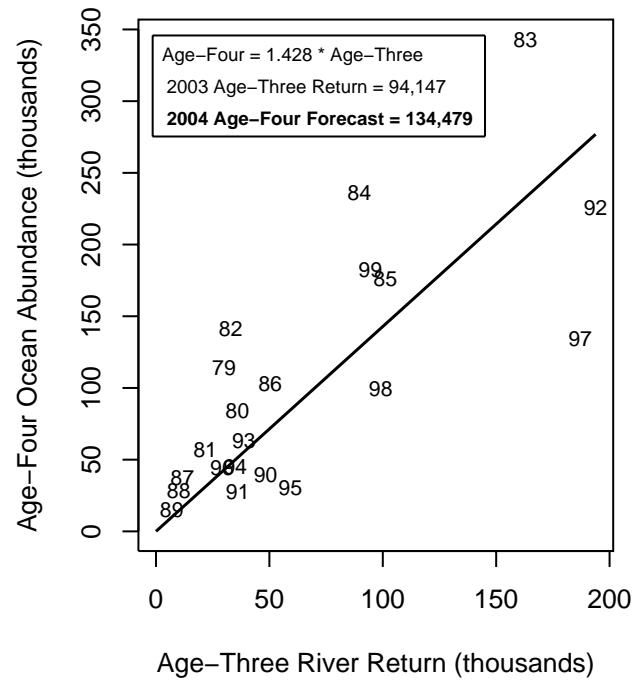
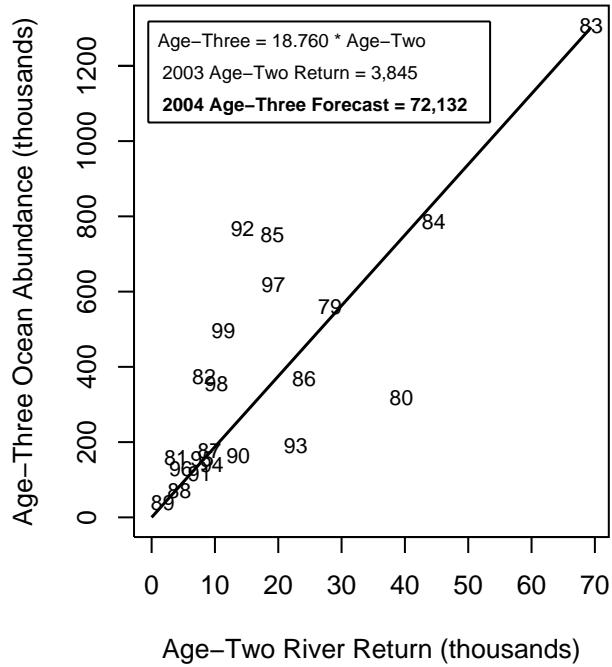


Figure 1. Regression estimators for Klamath River fall chinook ocean abundance (Sept. 1) based on that year's river return of same cohort. Numbers in plots denote brood years.

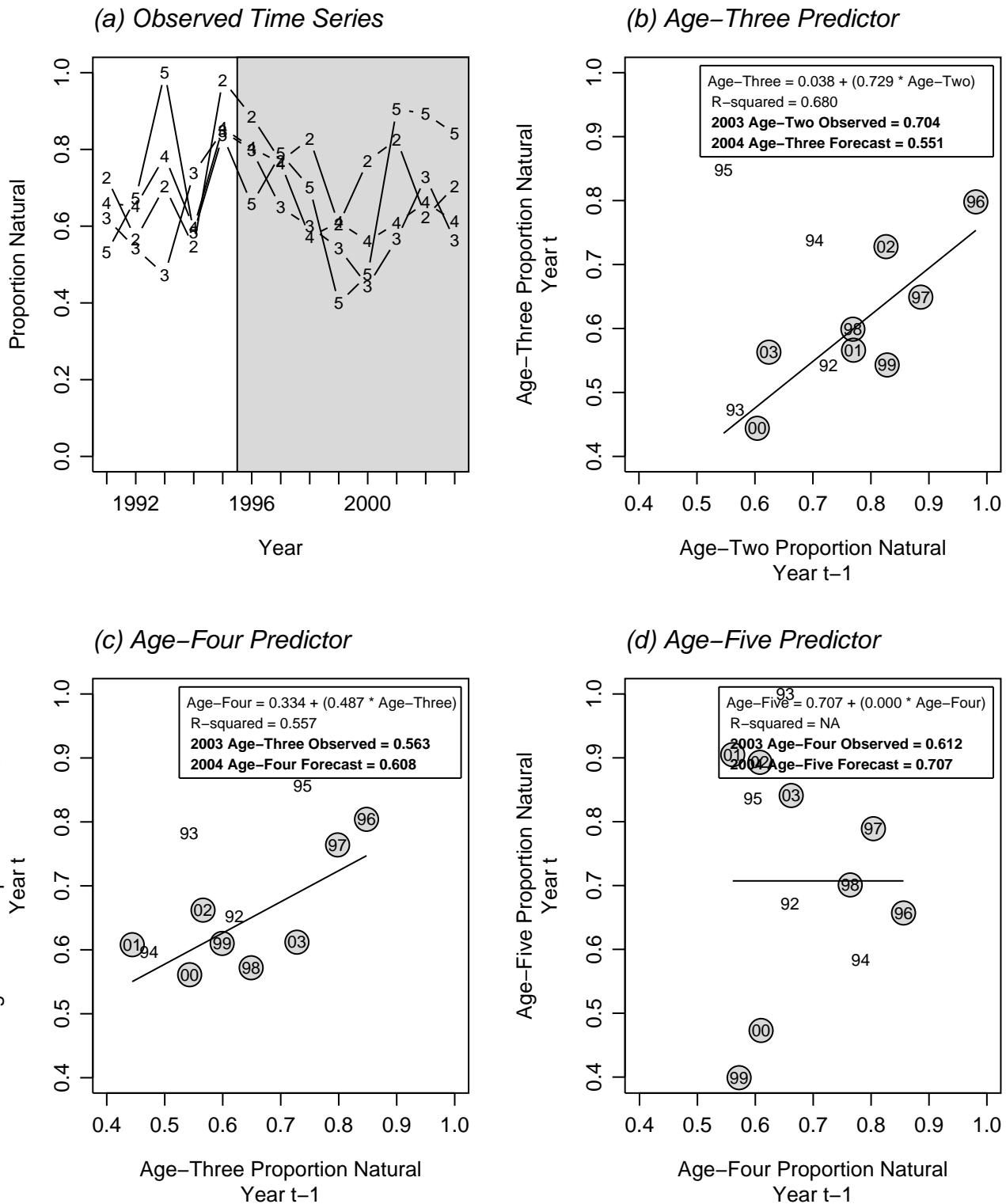


Figure 2. Age-specific proportion of natural spawners. Panel (a): observed time-series; numbers in plot denote age; shaded area depicts data used for predictor. Panels (b)–(d): age-specific predictor based on previous-year observed proportion for same cohort; numbers in plots denote years 1992–2003; shaded circles indicate years used for predictor; age-three and age-four are regression predictors; age-five predictor is arithmetic mean.

Table 1. Klamath River fall chinook ocean abundance (thousands), ocean harvest rate, and river-run size estimates (thousands) by age.

Calendar Year(t)	Ocean Abundance Sept(t-1)			Annual Ocean Harvest Rate Sept1(t-1) thru Aug31(t)			Klamath Basin River Run (t)			Total Adults	
	Age 3	Age 4	Total	Age 3	Age 4	Age 2	Age 3	Age 4	Age 5		
1981	493.2	57.0	550.2	0.21	0.53	28.2	64.1	14.4	1.8	80.3	
1982	559.2	133.4	692.5	0.30	0.52	39.4	30.1	33.9	2.6	66.6	
1983	317.9	114.4	432.3	0.19	0.60	3.8	35.9	20.7	0.9	57.5	
1984	157.5	84.1	241.6	0.08	0.38	8.3	21.7	24.4	1.1	47.2	
1985	374.6	56.9	431.5	0.11	0.25	69.4	32.9	25.7	5.8	64.4	
1986	1,307.9	141.1	1,449.0	0.18	0.46	44.6	162.9	29.8	2.3	195.0	
1987	786.3	343.2	1,129.5	0.16	0.43	19.1	89.7	112.6	6.8	209.1	
1988	750.5	236.2	986.7	0.20	0.39	24.1	101.2	86.5	3.9	191.6	
1989	367.2	176.3	543.5	0.15	0.36	9.1	50.4	69.6	4.3	124.3	
1990	177.7	103.1	280.8	0.30	0.55	4.4	11.6	22.9	1.3	35.9	
1991	69.7	37.3	107.0	0.03	0.18	1.8	10.0	21.6	1.1	32.7	
1992	39.5	28.3	67.7	0.02	0.07	13.7	6.9	18.8	1.0	26.7	
1993	164.9	15.0	179.9	0.05	0.16	7.6	48.3	8.2	0.7	57.2	
1994	116.2	39.6	155.8	0.03	0.09	14.4	36.0	24.7	1.0	61.7	
1995	768.4	27.6	796.0	0.04	0.13	22.8	193.8	17.5	2.4	213.8	
1996	190.5	225.6	416.1	0.05	0.16	9.5	38.8	136.7	0.3	175.8	
1997	140.4	62.9	203.3	0.01	0.06	8.0	35.0	44.2	4.6	83.7	
1998	154.6	44.9	199.5	0.00	0.09	4.6	59.2	29.7	1.7	90.6	
1999	129.2	30.2	159.5	0.01	0.09	19.2	29.2	20.5	1.3	51.0	
2000	617.0	44.2	661.3	0.06	0.10	10.2	187.1	30.5	0.5	218.1	
2001	356.5	134.0	490.5	0.03	0.09	11.3	99.1	88.2	0.2	187.4	
2002	496.1 ^{a/}	99.4	595.4	0.02 ^{a/}	0.15	9.2	94.6	62.5	3.7	160.8	
2003	478.1 ^{b/}	182.4 ^{a/}	660.5	---	^{c/} 0.21 ^{a/}	3.8	94.1	96.6	0.9	191.6	

a/ Preliminary: incomplete cohort data (age-5 data unavailable).

b/ Preliminary: incomplete cohort data (age-4 and age-5 data unavailable).

c/ Not estimated: incomplete cohort data (age-4 and age-5 data unavailable).

Table 2. Comparisons of preseason forecast and postseason estimates for ocean abundance of adult Klamath River fall chinook (Page 1 of 2).

Year (t)	Preseason Forecast ^{a/}	Postseason Estimate	Pre/Postseason
	Sept 1 (t-1)	Sept 1 (t-1)	
Age-Three			
1985	113,000	276,000	0.41
1986	426,000 ^{b/}	1,307,921	0.33
1987	511,800	786,276	0.65
1988	370,800	750,464	0.49
1989	450,600	367,188	1.23
1990	479,000	177,727	2.70
1991	176,200	69,656	2.53
1992	50,000	39,468	1.27
1993	294,400	164,852	1.79
1994	138,000	116,199	1.19
1995	269,000	768,376	0.35
1996	479,800	190,507	2.52
1997	224,600	140,389	1.60
1998	176,000	154,593	1.14
1999	84,800	129,239	0.66
2000	349,600	617,044	0.57
2001	187,200	356,503	0.53
2002 ^{c/}	209,000	496,062	0.42
2003 ^{c/}	171,300	478,117	0.36
Age-Four			
1985	56,875	57,500	0.99
1986	66,250	141,069	0.47
1987	206,125	343,177	0.60
1988	186,375	236,214	0.79
1989	215,500	176,333	1.22
1990	50,125	103,115	0.49
1991	44,625	37,325	1.20
1992	44,750	28,265	1.58
1993	39,125	15,003	2.61
1994	86,125	39,625	2.17
1995	47,000	27,609	1.70
1996	268,500	225,591	1.19
1997	53,875	62,900	0.86
1998	46,000	44,858	1.03
1999	78,750	30,245	2.60
2000	38,875	44,240	0.88
2001	247,000	134,007	1.84
2002	143,800	99,367	1.45
2003 ^{c/}	132,400	182,432	0.73

Table 2. Comparisons of preseason forecast and postseason estimates for ocean abundance of adult Klamath River fall chinook (Page 2 of 2).

Year (t)	Preseason Forecast ^{a/}	Postseason Estimate	Pre/Postseason
	Sept 1 (t-1)	Sept 1 (t-1)	
Age-Five			
1985 ^{d/}	--	11,273	--
1986 ^{d/}	--	5,878	--
1987	5,250	19,522	0.27
1988	13,250	14,708	0.90
1989	10,125	9,596	1.06
1990	7,625	7,710	0.99
1991	1,500	2,780	0.54
1992	1,250	1,448	0.86
1993	1,125	1,770	0.64
1994	500	1,423	0.35
1995	2,000	3,577	0.56
1996	1,125	788	1.43
1997	7,875	8,875	0.89
1998	3,250	2,390	1.36
1999	2,000	2,103	0.95
2000	1,375	859	1.60
2001	1,250	259	4.83
2002	9,700	6,926	1.40
2003	6,500	1,901	3.42
Total Adults			
1985 ^{d/}	169,875	344,773	0.49
1986 ^{d/}	492,250	1,454,868	0.34
1987	723,175	1,148,975	0.63
1988	570,425	1,001,386	0.57
1989	676,225	553,117	1.22
1990	536,750	288,552	1.86
1991	222,325	109,761	2.03
1992	96,000	69,181	1.39
1993	334,650	181,625	1.84
1994	224,625	157,247	1.43
1995	318,000	799,562	0.40
1996	749,425	416,886	1.80
1997	286,350	212,164	1.35
1998	225,250	201,841	1.12
1999	165,550	161,587	1.02
2000	389,850	662,143	0.59
2001	435,450	490,769	0.89
2002 ^{c/}	362,500	602,355	0.60
2003 ^{c/}	310,200	662,450	0.47

a/ Original preseason forecasts for years 1985-2001 were for May 1(t); converted to Sept 1(t-1) forecasts by dividing the May 1(t) number by the Sept 1(t-1) through May 1(t) survival rate presumed by modelers in those years: 0.5 age-three, 0.8 age-four, 0.8 age-5.

b/ A scalar of 0.75 was applied to the jack count because 1) most jacks returned to the Trinity River and 2) the jack count was outside the database range.

c/ Preliminary.

d/ Age-5 preseason ocean abundance forecast unavailable.

Table 3. Summary of management objectives and predictor performance for Klamath River fall chinook.

Year (t)	Preseason Stock		Postseason Stock		Preseason Harvest		Postseason Harvest		Preseason Adult		Postseason Adult	
	Abundance Forecast ^{a/}		Abundance Estimate		Rate Forecast on Age-four Fish ^{b/}		Rate Forecast on Age-four Fish ^{c/}		Harvest Forecast		Harvest Estimate	
	Sept 1 (t-1)	Age-3	Age-4	Sept 1 (t-1)	Age-3	Age-4	Ocean	River	Ocean	River	Ocean	River
1986	426,000	66,250	1,307,921	141,069	0.28	0.50	0.46	0.67	72,000	37,700	304,901	46,154
1987	511,800	206,125	786,276	343,177	0.28	0.53	0.43	0.44	121,200	78,200	279,321	73,265
1988	370,800	186,375	750,464	236,214	0.31	0.53	0.39	0.52	114,100	65,400	252,569	73,854
1989	450,600	215,500	367,188	176,333	0.30	0.49	0.36	0.70	128,100	67,600	123,833	54,340
1990	479,000	50,125	177,727	103,115	0.30	0.49	0.55	0.36	85,100	31,200	114,955	11,459
1991	176,200	44,625	69,656	37,325	0.13	0.28	0.18	0.45	16,700	12,800	9,962	13,581
1992	50,000	44,750	39,468	28,265	0.06	0.15	0.07	0.27	4,200	4,200	3,160	6,787
1993	294,400	39,125	164,852	15,003	0.12	0.43	0.16	0.49	20,100	22,500	11,267	12,808
1994	138,000	86,125	116,199	39,625	0.07	0.20	0.09	0.30	10,400	14,300	8,527	13,524
1995	269,000	47,000	768,376	27,609	0.07	0.32	0.13	0.20	13,500	18,500	31,304	21,638
1996	479,800	268,500	190,507	225,591	0.17	0.66	0.16	0.39	88,400	129,100	44,930	69,241
1997	224,600	53,875	140,389	62,900	0.10	0.43	0.06	0.26	17,600	26,500	8,624	17,764
1998	176,000	46,000	154,593	44,858	0.07	0.29	0.09	0.30	10,200	14,800	4,916	17,897
1999	84,800	78,750	129,239	30,245	0.10	0.28	0.09	0.45	12,300	18,100	5,083	16,942
2000	349,600	38,875	617,044	44,240	0.11	0.53	0.10	0.25	24,000	32,400	41,909	35,066
2001	187,200	247,000	356,503	134,007	0.14	0.61	0.09	0.29	45,600	105,300	21,613	50,780
2002	209,000	143,800	496,062	99,367	0.13	0.57	0.15	0.26	30,000	70,900	28,733	35,069
2003 ^{d/}	171,300	132,400	478,117	182,432	0.16	0.50	0.21	0.28	30,600	52,200	75,379	39,598

a/ Original preseason forecast for years 1986-2001 were for May 1(t); converted to Sept 1 (t-1) forecasts by dividing the May 1(t) number by the Sept 1(t-1) through May 1(t) survival rate presumed by modelers in those years: 0.5 age-three, 0.8 age-four, 0.8 age-five.

b/ Ocean harvest rate forecast is the fraction of the predicted ocean abundance expected to be harvested Sept 1 (t-1) through Aug 31 (t). River harvest rate forecast is the fraction of the predicted river run expected to be harvested in river fisheries. Original ocean harvest rate forecasts for year(t), 1986-2001, were based on a May 1(t) ocean abundance denominator; converted to Sept 1(t-1) abundance denominator by multiplying former values by 0.8 (the age-four survival rate between Sept 1 (t-1) and May (t) presumed by modelers in those years.

c/ Ocean harvest rate is the fraction of the postseason ocean abundance harvested Sept 1(t-1) through Aug 31(t). River harvest rate is the fraction of the river run harvested by river fisheries.

d/ Preliminary.

Table 4. Numbers of hatchery and natural adult fall chinook spawners in the Klamath Basin by age, 1985-2003.^{a/}

Year	Hatchery Spawners					Natural Area Spawners					Proportion Natural				
	Age 2	Age 3	Age 4	Age 5	Adults	Age 2	Age 3	Age 4	Age 5	Adults	Age 2	Age 3	Age 4	Age 5	Adults
1985					22,500					25,700					0.53
1986					32,900					113,400					0.78
1987					29,100					101,700					0.78
1988					33,500					79,400					0.70
1989					22,000					43,900					0.67
1990					8,100					15,600					0.66
1991	270	2,426	3,827	232	6,485	718	3,956	7,430	263	11,649	0.73	0.62	0.66	0.53	0.64
1992	3,948	2,576	4,627	157	7,360	5,143	3,051	8,657	321	12,029	0.57	0.54	0.65	0.67	0.62
1993	1,619	20,797	846	0	21,643	3,825	18,629	3,039	190	21,858	0.70	0.47	0.78	1.00	0.50
1994	5,200	7,877	6,702	160	14,739	6,245	22,230	9,879	224	32,333	0.55	0.74	0.60	0.58	0.69
1995	335	26,685	1,987	255	28,927	17,324	148,639	11,856	1,298	161,793	0.98	0.85	0.86	0.84	0.85
1996	792	4,360	15,649	24	20,033	6,174	17,232	64,048	46	81,326	0.89	0.80	0.80	0.66	0.80
1997	1,272	10,484	7,560	618	18,662	4,225	19,343	24,493	2,308	46,144	0.77	0.65	0.76	0.79	0.71
1998	595	20,411	8,588	220	29,219	2,855	30,509	11,462	517	42,488	0.83	0.60	0.57	0.70	0.59
1999	6,857	10,046	4,081	200	14,327	10,447	11,927	6,396	133	18,456	0.60	0.54	0.61	0.40	0.56
2000	1,909	87,643	9,833	136	97,612	6,394	70,042	12,565	122	82,729	0.77	0.44	0.56	0.47	0.46
2001	1,631	31,306	23,802	4	55,112	7,747	40,908	36,889	38	77,835	0.83	0.57	0.61	0.90	0.59
2002	2,331	15,867	11,177	137	27,181	3,867	42,557	21,932	1,146	65,635	0.62	0.73	0.66	0.89	0.71
2003	876	35,582	26,109	84	61,775	2,088	45,808	41,146	444	87,398	0.70	0.56	0.61	0.84	0.59

a/ Age structure of hatchery and natural area spawners not available prior to 1991.

Table 5. Harvest levels and rates of age-three and age-four Klamath River fall chinook. (Page 1 of 2)

Year(t)	Ocean Fisheries (Sept 1(t-1) through Aug 31(t))							River Fisheries (t)		
	KMZ			North of KMZ	South of KMZ	Subtotal	Ocean Total	River Fisheries (t)		
	Troll	Sport	Subtotal					Net	Sport	Total
HARVEST (numbers of fish)										
Age-Three										
1986	35,754	4,885	40,639	74,121	123,217	197,338	237,977	8,100	18,100	26,200
1987	17,556	5,158	22,714	43,461	57,351	100,812	123,526	11,400	11,400	22,800
1988	15,688	5,065	20,753	23,731	106,610	130,341	151,094	12,500	15,600	28,100
1989	6,308	11,771	18,079	15,273	23,451	38,724	56,803	2,700	900	3,600
1990	81	4,441	4,522	37,058	11,159	48,217	52,739	1,300	1,400	2,700
1991	0	1,032	1,032	350	824	1,174	2,206	2,123	1,277	3,400
1992	0	0	0	971	0	971	971	970	251	1,221
1993	0	812	812	819	6,360	7,179	7,991	5,426	2,917	8,343
1994	41	572	613	0	3,266	3,266	3,879	4,543	971	5,514
1995	0	985	985	11,857	14,478	26,335	27,320	11,840	5,536	17,376
1996	0	0	0	0	9,141	9,141	9,141	12,363	3,661	16,024
1997	0	233	233	611	1,211	1,822	2,055	2,166	2,736	4,902
1998	0	6	6	296	466	762	768	2,231	5,781	8,012
1999	61	174	235	1,252	435	1,687	1,922	4,981	1,748	6,729
2000	404	3,246	3,650	8,736	24,894	33,630	37,280	22,458	4,893	27,351
2001	115	105	220	2,730	5,998	8,728	8,948	17,885	7,294	25,179
2002 ^{a/}	212	760	972	1,569	9,559	11,128	12,100	11,734	6,258	17,992
2003 ^{a/}	210	940	1,150	2,373	33,243	35,616	36,766	6,973	5,074	12,047
Age-Four										
1986	7,762	1,117	8,879	23,408	31,995	55,403	64,282	17,000	2,900	19,900
1987	21,754	4,432	26,186	71,220	48,909	120,129	146,315	41,000	8,500	49,500
1988	11,921	3,629	15,550	27,089	50,494	77,583	93,133	38,600	6,200	44,800
1989	5,924	9,609	15,533	31,916	16,268	48,184	63,717	41,000	7,700	48,700
1990	3,955	2,864	6,819	39,377	10,499	49,876	56,695	6,000	2,200	8,200
1991	0	1,006	1,006	1,529	4,172	5,701	6,707	7,593	2,016	9,609
1992	172	55	227	1,799	12	1,811	2,038	4,360	723	5,083
1993	0	0	0	850	1,605	2,455	2,455	3,786	243	4,029
1994	0	1,073	1,073	1,117	1,419	2,536	3,609	6,666	812	7,478
1995	0	224	224	1,757	1,702	3,459	3,683	2,957	481	3,438
1996	769	3,451	4,220	10,278	20,766	31,044	35,264	43,959	9,080	53,039
1997	3	170	173	460	2,974	3,434	3,607	8,734	2,586	11,320
1998	0	101	101	3,973	0	3,973	4,074	7,164	1,822	8,986
1999	15	378	393	1,655	693	2,348	2,741	8,789	494	9,283
2000	116	892	1,008	2,453	1,052	3,505	4,513	6,733	756	7,489
2001	1,303	1,593	2,896	5,814	3,916	9,730	12,626	20,759	4,819	25,578
2002	1,912	813	2,725	3,233	9,226	12,459	15,184	11,929	4,063	15,992
2003 ^{a/}	785	873	1,658	7,666	28,296	35,962	37,620	22,640	4,601	27,241

Table 5. Harvest levels and rates of age-three and age-four Klamath River fall chinook. (Page 2 of 2)

Year(t)	Ocean Fisheries (Sept 1(t-1) through Aug 31(t))							River Fisheries (t)		
	KMZ			North of KMZ		South of KMZ		Ocean Total	River Fisheries (t)	
	Troll	Sport	Subtotal			Subtotal		Net	Sport	Total
HARVEST RATE^{b/}										
Age-Three										
1986	0.03	0.00	0.03	0.06	0.09	0.15	0.18	0.05	0.11	0.16
1987	0.02	0.01	0.03	0.06	0.07	0.13	0.16	0.13	0.13	0.25
1988	0.02	0.01	0.03	0.03	0.14	0.17	0.20	0.12	0.15	0.28
1989	0.02	0.03	0.05	0.04	0.06	0.11	0.15	0.05	0.02	0.07
1990	0.00	0.02	0.03	0.21	0.06	0.27	0.30	0.11	0.12	0.23
1991	0.00	0.01	0.01	0.01	0.01	0.02	0.03	0.21	0.13	0.34
1992	0.00	0.00	0.00	0.02	0.00	0.02	0.02	0.14	0.04	0.18
1993	0.00	0.00	0.00	0.00	0.04	0.04	0.05	0.11	0.06	0.17
1994	0.00	0.00	0.01	0.00	0.03	0.03	0.03	0.13	0.03	0.15
1995	0.00	0.00	0.00	0.02	0.02	0.03	0.04	0.06	0.03	0.09
1996	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.32	0.09	0.41
1997	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.06	0.08	0.14
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.10	0.14
1999	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.17	0.06	0.23
2000	0.00	0.01	0.01	0.01	0.04	0.05	0.06	0.12	0.03	0.15
2001	0.00	0.00	0.00	0.01	0.02	0.02	0.03	0.18	0.07	0.25
2002 ^{a/}	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.12	0.07	0.19
2003 ^{a/}	0.00	0.00	0.00	0.00	0.07	0.07	0.08	0.07	0.05	0.13
Age-Four										
1986	0.06	0.01	0.06	0.17	0.23	0.39	0.46	0.57	0.10	0.67
1987	0.06	0.01	0.08	0.21	0.14	0.35	0.43	0.36	0.08	0.44
1988	0.05	0.02	0.07	0.11	0.21	0.33	0.39	0.45	0.07	0.52
1989	0.03	0.05	0.09	0.18	0.09	0.27	0.36	0.59	0.11	0.70
1990	0.04	0.03	0.07	0.38	0.10	0.48	0.55	0.26	0.10	0.36
1991	0.00	0.03	0.03	0.04	0.11	0.15	0.18	0.35	0.09	0.45
1992	0.01	0.00	0.01	0.06	0.00	0.06	0.07	0.23	0.04	0.27
1993	0.00	0.00	0.00	0.06	0.11	0.16	0.16	0.46	0.03	0.49
1994	0.00	0.03	0.03	0.03	0.04	0.06	0.09	0.27	0.03	0.30
1995	0.00	0.01	0.01	0.06	0.06	0.13	0.13	0.17	0.03	0.20
1996	0.00	0.02	0.02	0.05	0.09	0.14	0.16	0.32	0.07	0.39
1997	0.00	0.00	0.00	0.01	0.05	0.05	0.06	0.20	0.06	0.26
1998	0.00	0.00	0.00	0.09	0.00	0.09	0.09	0.24	0.06	0.30
1999	0.00	0.01	0.01	0.05	0.02	0.08	0.09	0.43	0.02	0.45
2000	0.00	0.02	0.02	0.06	0.02	0.08	0.10	0.22	0.02	0.25
2001	0.01	0.01	0.02	0.04	0.03	0.07	0.09	0.24	0.05	0.29
2002	0.02	0.01	0.03	0.03	0.09	0.13	0.15	0.19	0.06	0.26
2003 ^{a/}	0.00	0.00	0.01	0.04	0.16	0.20	0.21	0.23	0.05	0.28

a/ Preliminary data (incomplete cohort).

b/ Ocean harvest rates are the fraction of Sept 1(t-1) ocean abundance harvested in these fisheries. River harvest rates are the fraction of the river run (t) harvested in these fisheries.

Table 6. Fall 2003 (September - November) ocean landings of Klamath River fall chinook by fishery, age, and KOHM area.^{a/}

KOHM area	Commercial Fishery									Total	
	Age 3			Age 4			Age 5				
	Sept	Oct	Nov	Sept	Oct	Nov	Sept	Oct	Nov		
NO	--	--	--	786	1,015	--	493	221	--	2,515	
CO	--	--	--	157	22	--	192	62	--	433	
KO	--	--	--	84	--	--	103	--	--	187	
KC	--	--	--	486	--	--	112	--	--	598	
FB	--	--	--	1659	--	--	906	--	--	2,565	
SF	--	--	--	272	36	--	--	--	--	308	
MO	--	--	--	--	--	--	--	--	--	0	
Total	0	0	0	3,444	1,073	0	1,806	283	0	6,606	

KOHM area	Recreational Fishery									Total	
	Age 3			Age 4			Age 5				
	Sept	Oct	Nov	Sept	Oct	Nov	Sept	Oct	Nov		
NO	--	--	--	--	25	--	47	--	--	72	
CO	--	--	--	19	16	--	27	--	--	62	
KO	--	--	--	527	72	--	407	--	--	1,006	
KC	--	--	--	--	--	--	--	--	--	0	
FB	--	--	--	--	--	--	--	--	--	0	
SF	--	--	--	--	--	--	--	--	--	0	
MO	--	--	--	--	--	--	--	--	--	0	
Total	0	0	0	546	113	0	481	0	0	1,140	

a/ KOHM areas are as follows: NO=Newport & Tillamook; CO=Coos Bay; KO=Klamath Management Zone in Oregon; KC=Klamath Management Zone in California; FB=Fort Bragg; SF=San Francisco; and MO=Monterey.

Appendix A. KOHM: Summary Output. Mon Mar 01 17:26:39 2004

2004 stock projections; no 2004 fishing.

Klamath Escapement

Absent fishing:	118894	
Hatcherries:	46557	
Natural areas:	72337	
 With fishing		
Mature adults:	112689	
Strays:	450	
Klamath Basin:	112239	
Spawners:	112239	
Hatcherries:	44179	
Natural areas:	68060	(objective: >= 35000)
Reduction rate:	0.059	(objective: <= 0.516)

Klamath Harvest

Total:	7746
River:	0
Ocean:	7746
 Tribal:	0 0.000 (objective: 0.000)
 Non-tribal:	7746
River:	0 0.000
Ocean troll:	6607
CA / OR:	0.525 / 0.475
Ocean sport:	1139
KMZ:	1006 0.130
Age-four o.harv.rate:	0.038 (objective: <= 0.16)

Klamath Harvest: ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	1279	1236	0	0	0	0	0	0	0	0	0	0	2514
CO	349	85	0	0	0	0	0	0	0	0	0	0	434
KO	188	0	0	0	0	0	0	0	0	0	0	0	188
KC	598	0	0	0	0	0	0	0	0	0	0	0	598
FB	2565	0	0	0	0	0	0	0	0	0	0	0	2565
SF	272	36	0	0	0	0	0	0	0	0	0	0	308
MO	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5251	1356	0	0	0	0	0	0	0	0	0	0	6607

Klamath Harvest: ocean sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	47	25	0	0	0	0	0	0	0	0	0	0	71
CO	46	16	0	0	0	0	0	0	0	0	0	0	61
KO	934	72	0	0	0	0	0	0	0	0	0	0	1006
KC	0	0	0	0	0	0	0	0	0	0	0	0	0
FB	0	0	0	0	0	0	0	0	0	0	0	0	0
SF	0	0	0	0	0	0	0	0	0	0	0	0	0
MO	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1026	112	0	0	0	0	0	0	0	0	0	0	1139

Chinook Harvest (All Stocks): Troll

Chinook Harvest (All Stocks): Sport

Klamath Contribution Rates: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.033	0.039	0	NA	NA	NA	0.025	0.025	0.056	0.018	0.053	0.063
CO	0.034	0.012	0	0	NA	NA	0.031	0.031	0.075	0.053	0.114	0.162
KO	0.171	0.000	0	NA	NA	NA	0.199	0.199	0.199	0.183	0.274	0.180
KC	0.272		NA	NA	NA	NA	NA	NA	0.461	0.336	0.178	0.367
FB	0.042		NA	NA	NA	NA	NA	NA	0.143	0.148	0.102	0.033
SF	0.028	0.018	NA	NA	NA	NA	NA	NA	0.054	0.049	0.036	0.016
MO	0.000		NA	NA	NA	NA	NA	NA	0.010	0.013	0.043	0.001

Klamath Contribution Rates: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.018	0.019	0	NA	NA	NA	NA	NA	0.298	0.035	0.025	0.054
CO	0.033	1.555	NA	NA	NA	NA	NA	NA	0.704	0.050	0.039	0.015
KO	0.584	0.120	NA	NA	NA	NA	NA	NA	0.022	0.057	0.103	0.186
KC	0.000		NA	NA	NA	NA	NA	NA	0.103	0.091	0.081	0.155
FB	0.000	0.000	NA	NA	NA	NA	NA	0.051	0.089	0.038	0.030	0.051
SF	0.000	0.000	NaN	NA	NA	0.013	0.003	0.013	0.007	0.024	0.008	0.002
MO	NaN		NA	NA	NA	NA	0.012	0.015	0.002	0.002	0.013	0.061

Season Effort: Troll

Season Effort: Sport

Quota Effort: Troll

Quota Effort: Sport

Total Effort: Troll

Total Effort: Sport

Total	NA	NA	NA	NA	0	0	0	0	0	0	0	0
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Days open: ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
CO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	0	0	0	0
SF	NA	NA	NA	NA	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	0	0	0	0	0	0	0	0

Concurrent days open: FB,SF,MO in May

0 , 0 , 0

Concurrent days open: FB,SF,MO in Jun

0 , 0 , 0

Concurrent days open: FB,SF,MO in Jul

0 , 0 , 0

Concurrent days open: FB,SF,MO in Aug

0 , 0 , 0

Days open: ocean sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
CO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KO	NA	NA	NA	NA	0	0	0	0	0	0	0	0
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	0	0	0	0
SF	NA	NA	NA	NA	0	0	0	0	0	0	0	0
MO	NA	NA	NA	NA	0	0	0	0	0	0	0	0

Concurrent coho/chinook days open: NO,CO in Jun

0 , 0

Concurrent coho/chinook days open: NO,CO in Jul

0 , 0

Concurrent coho/chinook days open: NO,CO in Aug

0 , 0

Chinook Quotas (All Stocks): ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA											
CO	NA											
KO	NA											
KC	NA											
FB	NA											
SF	NA											
MO	NA											

Chinook Quotas (All Stocks): ocean sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA											
CO	NA											
KO	NA											
KC	NA											
FB	NA											
SF	NA											
MO	NA											

Size limits: ocean

fishery month area limit

1	10	9	NO	27
2	10	10	NO	28
3	10	5	NO	27
4	10	6	NO	27
5	10	7	NO	27
6	10	8	NO	27
7	10	9	CO	27
8	10	10	CO	28
9	10	5	CO	27
10	10	6	CO	27
11	10	7	CO	27
12	10	8	CO	27
13	10	9	KO	28
14	40	2	FB	24
15	40	3	FB	24
16	40	4	FB	24
17	40	4	SF	24
18	40	3	MO	24
19	40	4	MO	24

Allocation objective:

River Sport: 0
KMZ Sport: 0
Tribes: 0

Klamath escapement buffer: 0

Appendix B. KOHM: Summary Output. Mon Mar 01 17:06:20 2004

2004 stock projections; 2003 ocean regs; riv.rec 15%.

Klamath Escapement

Absent fishing:	118894	
Hatcheries:	46557	
Natural areas:	72337	
With fishing		
Mature adults:	96128	
Strays:	385	
Klamath Basin:	95743	
Spawners:	55118	
Hatcheries:	22001	(objective: >= 35000)
Natural areas:	33117	(objective: <= 0.516)
Reduction rate:	0.542	

Klamath Harvest

Total:	65524		
River:	37676		
Ocean:	27848		
 Tribal:	32762	0.500	(objective: 0.500)
 Non-tribal:	32762		
River:	4914	0.150	
Ocean troll:	22787		
CA / OR:	0.562	/ 0.438	
Ocean sport:	5061		
KMZ:	3687	0.132	
Age-four o.harv.rate:	0.158		(objective: <= 0.16)

Klamath Harvest: ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	1279	1236	0	0	0	0	26	317	624	226	268	667	4642
CO	349	85	0	0	0	0	17	389	429	591	998	982	3841
KO	188	0	0	0	0	0	0	0	86	457	329	449	1509
KC	598	0	0	0	0	0	0	0	0	0	0	0	598
FB	2565	0	0	0	0	0	0	0	1770	0	2250	809	7394
SF	272	36	0	0	0	0	0	0	693	1878	963	168	4010
MO	0	0	0	0	0	0	0	0	119	381	292	1	794
Total	5251	1356	0	0	0	0	42	706	3721	3533	5101	3076	22787

Klamath Harvest: ocean sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	47	25	0	0	0	0	0	0	1	2	35	73	182
CO	46	16	0	0	0	0	0	0	4	35	80	41	221
KO	934	72	0	0	0	0	0	0	4	122	378	488	1998
KC	0	0	0	0	0	0	0	0	118	400	679	492	1689
FB	0	0	0	0	0	0	0	10	66	142	219	25	461
SF	0	0	0	0	0	0	0	51	24	138	174	4	390
MO	0	0	0	0	0	0	0	31	11	13	56	7	120
Total	1026	112	0	0	0	0	0	91	229	851	1620	1130	5061

Chinook Harvest (All Stocks): Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	38800	31900	30	NA	NA	NA	1037	12880	11138	12513	5083	10639	124020
CO	10300	6800	1000	100	NA	NA	527	12396	5702	11164	8769	6059	62817
KO	1100	600	10	NA	NA	NA	0	0	431	2500	1200	2500	8341
KC	2200	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	2200
FB	60800	NA	NA	NA	NA	NA	NA	NA	12380	0	22065	24398	119643
SF	9600	2000	NA	NA	NA	NA	NA	NA	12865	38166	26890	10354	99875
MO	1100	NA	NA	NA	NA	NA	NA	NA	12105	28668	6772	673	49317
Total	123900	41300	1040	100	NA	NA	1564	25276	54622	93010	70778	54623	466213

Chinook Harvest (All Stocks): Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total	
NO	2600	1300	100	NA	NA	NA	NA	NA	4	52	1377	1337	6770	
CO	1400	10	NA	NA	NA	NA	NA	NA	6	694	2067	2644	6822	
KO	1600	600	NA	NA	NA	NA	NA	NA	195	2155	3660	2623	10833	
KC	800	NA	NA	NA	NA	NA	NA	NA	1141	4403	8430	3179	17953	
FB	400	10	NA	NA	NA	NA	NA	NA	188	741	3733	7190	493	12755
SF	3100	1000	0	NA	NA	0	0	3773	3613	5617	20961	2088	40152	
MO	0	NA	NA	NA	NA	NA	28	1992	4759	7776	4372	123	19050	
Total	9900	2920	100	NA	NA	0	28	5953	10457	24431	48058	12488	114335	

Klamath Contribution Rates: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.033	0.039	0	NA	NA	NA	0.025	0.025	0.056	0.018	0.053	0.063
CO	0.034	0.012	0	0	NA	NA	0.031	0.031	0.075	0.053	0.114	0.162
KO	0.171	0.000	0	NA	NA	NA	0.199	0.199	0.199	0.183	0.274	0.180
KC	0.272	NA	NA	NA	NA	NA	NA	NA	0.461	0.336	0.178	0.367
FB	0.042	NA	NA	NA	NA	NA	NA	NA	0.143	0.148	0.102	0.033
SF	0.028	0.018	NA	NA	NA	NA	NA	NA	0.054	0.049	0.036	0.016
MO	0.000	NA	NA	NA	NA	NA	NA	NA	0.010	0.013	0.043	0.001

Klamath Contribution Rates: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.018	0.019	0	NA	NA	NA	NA	NA	0.298	0.035	0.025	0.054
CO	0.033	1.555	NA	NA	NA	NA	NA	NA	0.704	0.050	0.039	0.015
KO	0.584	0.120	NA	NA	NA	NA	NA	NA	0.022	0.057	0.103	0.186
KC	0.000	NA	NA	NA	NA	NA	NA	NA	0.103	0.091	0.081	0.155
FB	0.000	0.000	NA	NA	NA	NA	NA	0.051	0.089	0.038	0.030	0.051
SF	0.000	0.000	NaN	NA	NA	0.013	0.003	0.013	0.007	0.024	0.008	0.002
MO	NAN	NA	NA	NA	NA	NA	0.012	0.015	0.002	0.002	0.013	0.061

Season Effort: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	176	429	1077	1168	772	781	4403
CO	NA	NA	NA	NA	0	0	176	434	482	692	538	436	2757
KO	NA	NA	NA	NA	0	0	6	16	50	0	0	0	72
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	1118	0	1560	1600	4278
SF	NA	NA	NA	NA	0	0	0	0	1855	2301	1796	1215	7168
MO	NA	NA	NA	NA	0	0	0	0	1552	2731	1115	303	5701
Total	NA	NA	NA	NA	0	0	358	879	6133	6891	5781	4337	24379

Season Effort: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	50	31	650	4072	22217	18831	45851
CO	NA	NA	NA	NA	0	0	40	58	334	4113	16601	13853	34999
KO	NA	NA	NA	NA	0	0	0	0	2105	4850	11481	8660	27096
KC	NA	NA	NA	NA	0	0	0	0	2949	8880	18012	8547	38387
FB	NA	NA	NA	NA	0	106	427	973	2477	6673	10485	5358	26500
SF	NA	NA	NA	NA	0	0	0	5253	8669	12592	27085	16892	70491
MO	NA	NA	NA	NA	0	0	1228	16592	10885	9892	12246	3436	54279
Total	NA	NA	NA	NA	0	106	1744	22907	28069	51073	118126	75577	297602

Quota Effort: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA												
CO	NA												
KO	NA	122	85	132	339								
KC	NA												
FB	NA												
SF	NA												
MO	NA												
Total	NA	122	85	132	339								

Quota Effort: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA												
CO	NA												
KO	NA												
KC	NA												
FB	NA												
SF	NA												
MO	NA												
Total	NA												

Total Effort: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	176	429	1077	1168	772	781	4403
CO	NA	NA	NA	NA	0	0	176	434	482	692	538	436	2757
KO	NA	NA	NA	NA	0	0	6	16	50	122	85	132	411
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	1118	0	1560	1600	4278
SF	NA	NA	NA	NA	0	0	0	0	1855	2301	1796	1215	7168
MO	NA	NA	NA	NA	0	0	0	0	1552	2731	1115	303	5701
Total	NA	NA	NA	NA	0	0	358	879	6133	7013	5866	4469	24718

Total Effort: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	50	31	650	4072	22217	18831	45851
CO	NA	NA	NA	NA	0	0	40	58	334	4113	16601	13853	34999
KO	NA	NA	NA	NA	0	0	0	0	2105	4850	11481	8660	27096
KC	NA	NA	NA	NA	0	0	0	0	2949	8880	18012	8547	38387
FB	NA	NA	NA	NA	0	106	427	973	2477	6673	10485	5358	26500
SF	NA	NA	NA	NA	0	0	0	5253	8669	12592	27085	16892	70491
MO	NA	NA	NA	NA	0	0	1228	16592	10885	9892	12246	3436	54279

Total NA NA NA NA 0 106 1744 22907 28069 51073 118126 75577 297602

Days open: ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	17	30	31	30	16	19
CO	NA	NA	NA	NA	0	0	17	30	31	30	15	19
KO	NA	NA	NA	NA	0	0	17	30	31	0	0	0
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	31	0	26	31
SF	NA	NA	NA	NA	0	0	0	0	31	30	31	31
MO	NA	NA	NA	NA	0	0	0	0	31	30	31	31

Concurrent days open: FB,SF,MO in May
31 , 31 , 31

Concurrent days open: FB,SF,MO in Jun
0 , 0 , 0

Concurrent days open: FB,SF,MO in Jul
26 , 26 , 26

Concurrent days open: FB,SF,MO in Aug
31 , 31 , 31

Days open: ocean sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	17	30	31	30	31	31
CO	NA	NA	NA	NA	0	0	17	30	31	30	31	31
KO	NA	NA	NA	NA	0	0	0	0	15	30	31	31
KC	NA	NA	NA	NA	0	0	0	0	15	30	31	31
FB	NA	NA	NA	NA	0	14	31	30	31	30	31	31
SF	NA	NA	NA	NA	0	0	0	19	31	30	31	31
MO	NA	NA	NA	NA	0	0	3	30	31	30	31	31

Concurrent coho/chinook days open: NO,CO in Jun
10 , 10

Concurrent coho/chinook days open: NO,CO in Jul
31 , 31

Concurrent coho/chinook days open: NO,CO in Aug
24 , 24

Chinook Quotas (All Stocks): ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA									
CO	NA	NA	NA									
KO	NA	2500	1200	2500								
KC	NA	NA	NA									
FB	NA	NA	NA									
SF	NA	NA	NA									
MO	NA	NA	NA									

Chinook Quotas (All Stocks): ocean sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA											
CO	NA											
KO	NA											
KC	NA											
FB	NA											
SF	NA											
MO	NA											

Size limits: ocean

fishery month area limit

1	10	9	NO	27
2	10	10	NO	28
3	10	5	NO	27
4	10	6	NO	27
5	10	7	NO	27
6	10	8	NO	27
7	10	9	CO	27
8	10	10	CO	28
9	10	5	CO	27
10	10	6	CO	27
11	10	7	CO	27
12	10	8	CO	27
13	10	9	KO	28
14	40	2	FB	24
15	40	3	FB	24
16	40	4	FB	24
17	40	4	SF	24
18	40	3	MO	24
19	40	4	MO	24

Allocation objective:

River Sport: 0.15
KMZ Sport: NA
Tribes: 0.5

Klamath escapement buffer: 0

Appendix C. KOHM: Summary Output. Mon Mar 01 16:55:51 2004

2004 stock projections; 2003 ocean regs; riv.rec % to make floor.

Klamath Escapement

Absent fishing:	118894
Hatcherries:	46557
Natural areas:	72337
With fishing	
Mature adults:	96128
Strays:	385
Klamath Basin:	95743
Spawners:	58214
Hatcherries:	23214
Natural areas:	35000
Reduction rate:	0.516
	(objective: >= 35000)
	(objective: <= 0.516)

Klamath Harvest

Total:	62585
River:	34738
Ocean:	27848
Tribal:	31293 0.500 (objective: 0.500)
Non-tribal:	31293
River:	3445 0.110
Ocean troll:	22787
CA / OR:	0.562 / 0.438
Ocean sport:	5061
KMZ:	3687 0.132
Age-four o.harv.rate:	0.158 (objective: <= 0.16)

Klamath Harvest: ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	1279	1236	0	0	0	0	26	317	624	226	268	667	4642
CO	349	85	0	0	0	0	17	389	429	591	998	982	3841
KO	188	0	0	0	0	0	0	0	86	457	329	449	1509
KC	598	0	0	0	0	0	0	0	0	0	0	0	598
FB	2565	0	0	0	0	0	0	0	1770	0	2250	809	7394
SF	272	36	0	0	0	0	0	0	693	1878	963	168	4010
MO	0	0	0	0	0	0	0	0	119	381	292	1	794
Total	5251	1356	0	0	0	0	42	706	3721	3533	5101	3076	22787

Klamath Harvest: ocean sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	47	25	0	0	0	0	0	0	1	2	35	73	182
CO	46	16	0	0	0	0	0	0	4	35	80	41	221
KO	934	72	0	0	0	0	0	0	4	122	378	488	1998
KC	0	0	0	0	0	0	0	0	118	400	679	492	1689
FB	0	0	0	0	0	0	0	10	66	142	219	25	461
SF	0	0	0	0	0	0	0	51	24	138	174	4	390
MO	0	0	0	0	0	0	0	31	11	13	56	7	120
Total	1026	112	0	0	0	0	0	91	229	851	1620	1130	5061

Chinook Harvest (All Stocks): Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	38800	31900	30	NA	NA	NA	1037	12880	11138	12513	5083	10639	124020
CO	10300	6800	1000	100	NA	NA	527	12396	5702	11164	8769	6059	62817
KO	1100	600	10	NA	NA	NA	0	0	431	2500	1200	2500	8341
KC	2200	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	2200
FB	60800	NA	NA	NA	NA	NA	NA	NA	12380	0	22065	24398	119643
SF	9600	2000	NA	NA	NA	NA	NA	NA	12865	38166	26890	10354	99875
MO	1100	NA	NA	NA	NA	NA	NA	NA	12105	28668	6772	673	49317
Total	123900	41300	1040	100	NA	NA	1564	25276	54622	93010	70778	54623	466213

Chinook Harvest (All Stocks): Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total	
NO	2600	1300	100	NA	NA	NA	NA	NA	4	52	1377	1337	6770	
CO	1400	10	NA	NA	NA	NA	NA	NA	6	694	2067	2644	6822	
KO	1600	600	NA	NA	NA	NA	NA	NA	195	2155	3660	2623	10833	
KC	800	NA	NA	NA	NA	NA	NA	NA	1141	4403	8430	3179	17953	
FB	400	10	NA	NA	NA	NA	NA	NA	188	741	3733	7190	493	12755
SF	3100	1000	0	NA	NA	0	0	3773	3613	5617	20961	2088	40152	
MO	0	NA	NA	NA	NA	NA	28	1992	4759	7776	4372	123	19050	
Total	9900	2920	100	NA	NA	0	28	5953	10457	24431	48058	12488	114335	

Klamath Contribution Rates: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.033	0.039	0	NA	NA	NA	0.025	0.025	0.056	0.018	0.053	0.063
CO	0.034	0.012	0	0	NA	NA	0.031	0.031	0.075	0.053	0.114	0.162
KO	0.171	0.000	0	NA	NA	NA	0.199	0.199	0.199	0.183	0.274	0.180
KC	0.272	NA	NA	NA	NA	NA	NA	NA	0.461	0.336	0.178	0.367
FB	0.042	NA	NA	NA	NA	NA	NA	NA	0.143	0.148	0.102	0.033
SF	0.028	0.018	NA	NA	NA	NA	NA	NA	0.054	0.049	0.036	0.016
MO	0.000	NA	NA	NA	NA	NA	NA	NA	0.010	0.013	0.043	0.001

Klamath Contribution Rates: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	0.018	0.019	0	NA	NA	NA	NA	NA	0.298	0.035	0.025	0.054
CO	0.033	1.555	NA	NA	NA	NA	NA	NA	0.704	0.050	0.039	0.015
KO	0.584	0.120	NA	NA	NA	NA	NA	NA	0.022	0.057	0.103	0.186
KC	0.000	NA	NA	NA	NA	NA	NA	NA	0.103	0.091	0.081	0.155
FB	0.000	0.000	NA	NA	NA	NA	NA	0.051	0.089	0.038	0.030	0.051
SF	0.000	0.000	NaN	NA	NA	0.013	0.003	0.013	0.007	0.024	0.008	0.002
MO	NAN	NA	NA	NA	NA	NA	0.012	0.015	0.002	0.002	0.013	0.061

Season Effort: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	176	429	1077	1168	772	781	4403
CO	NA	NA	NA	NA	0	0	176	434	482	692	538	436	2757
KO	NA	NA	NA	NA	0	0	6	16	50	0	0	0	72
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	1118	0	1560	1600	4278
SF	NA	NA	NA	NA	0	0	0	0	1855	2301	1796	1215	7168
MO	NA	NA	NA	NA	0	0	0	0	1552	2731	1115	303	5701
Total	NA	NA	NA	NA	0	0	358	879	6133	6891	5781	4337	24379

Season Effort: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	50	31	650	4072	22217	18831	45851
CO	NA	NA	NA	NA	0	0	40	58	334	4113	16601	13853	34999
KO	NA	NA	NA	NA	0	0	0	0	2105	4850	11481	8660	27096
KC	NA	NA	NA	NA	0	0	0	0	2949	8880	18012	8547	38387
FB	NA	NA	NA	NA	0	106	427	973	2477	6673	10485	5358	26500
SF	NA	NA	NA	NA	0	0	0	5253	8669	12592	27085	16892	70491
MO	NA	NA	NA	NA	0	0	1228	16592	10885	9892	12246	3436	54279
Total	NA	NA	NA	NA	0	106	1744	22907	28069	51073	118126	75577	297602

Quota Effort: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA												
CO	NA												
KO	NA	122	85	132	339								
KC	NA												
FB	NA												
SF	NA												
MO	NA												
Total	NA	122	85	132	339								

Quota Effort: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA												
CO	NA												
KO	NA												
KC	NA												
FB	NA												
SF	NA												
MO	NA												
Total	NA												

Total Effort: Troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	176	429	1077	1168	772	781	4403
CO	NA	NA	NA	NA	0	0	176	434	482	692	538	436	2757
KO	NA	NA	NA	NA	0	0	6	16	50	122	85	132	411
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	1118	0	1560	1600	4278
SF	NA	NA	NA	NA	0	0	0	0	1855	2301	1796	1215	7168
MO	NA	NA	NA	NA	0	0	0	0	1552	2731	1115	303	5701
Total	NA	NA	NA	NA	0	0	358	879	6133	7013	5866	4469	24718

Total Effort: Sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
NO	NA	NA	NA	NA	0	0	50	31	650	4072	22217	18831	45851
CO	NA	NA	NA	NA	0	0	40	58	334	4113	16601	13853	34999
KO	NA	NA	NA	NA	0	0	0	0	2105	4850	11481	8660	27096
KC	NA	NA	NA	NA	0	0	0	0	2949	8880	18012	8547	38387
FB	NA	NA	NA	NA	0	106	427	973	2477	6673	10485	5358	26500
SF	NA	NA	NA	NA	0	0	0	5253	8669	12592	27085	16892	70491
MO	NA	NA	NA	NA	0	0	1228	16592	10885	9892	12246	3436	54279

Total NA NA NA NA 0 106 1744 22907 28069 51073 118126 75577 297602

Days open: ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	17	30	31	30	16	19
CO	NA	NA	NA	NA	0	0	17	30	31	30	15	19
KO	NA	NA	NA	NA	0	0	17	30	31	0	0	0
KC	NA	NA	NA	NA	0	0	0	0	0	0	0	0
FB	NA	NA	NA	NA	0	0	0	0	31	0	26	31
SF	NA	NA	NA	NA	0	0	0	0	31	30	31	31
MO	NA	NA	NA	NA	0	0	0	0	31	30	31	31

Concurrent days open: FB,SF,MO in May
31 , 31 , 31

Concurrent days open: FB,SF,MO in Jun
0 , 0 , 0

Concurrent days open: FB,SF,MO in Jul
26 , 26 , 26

Concurrent days open: FB,SF,MO in Aug
31 , 31 , 31

Days open: ocean sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA	NA	0	0	17	30	31	30	31	31
CO	NA	NA	NA	NA	0	0	17	30	31	30	31	31
KO	NA	NA	NA	NA	0	0	0	0	15	30	31	31
KC	NA	NA	NA	NA	0	0	0	0	15	30	31	31
FB	NA	NA	NA	NA	0	14	31	30	31	30	31	31
SF	NA	NA	NA	NA	0	0	0	19	31	30	31	31
MO	NA	NA	NA	NA	0	0	3	30	31	30	31	31

Concurrent coho/chinook days open: NO,CO in Jun
10 , 10

Concurrent coho/chinook days open: NO,CO in Jul
31 , 31

Concurrent coho/chinook days open: NO,CO in Aug
24 , 24

Chinook Quotas (All Stocks): ocean troll

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA	NA	NA									
CO	NA	NA	NA									
KO	NA	2500	1200	2500								
KC	NA	NA	NA									
FB	NA	NA	NA									
SF	NA	NA	NA									
MO	NA	NA	NA									

Chinook Quotas (All Stocks): ocean sport

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NO	NA											
CO	NA											
KO	NA											
KC	NA											
FB	NA											
SF	NA											
MO	NA											

Size limits: ocean

fishery month area limit

1	10	9	NO	27
2	10	10	NO	28
3	10	5	NO	27
4	10	6	NO	27
5	10	7	NO	27
6	10	8	NO	27
7	10	9	CO	27
8	10	10	CO	28
9	10	5	CO	27
10	10	6	CO	27
11	10	7	CO	27
12	10	8	CO	27
13	10	9	KO	28
14	40	2	FB	24
15	40	3	FB	24
16	40	4	FB	24
17	40	4	SF	24
18	40	3	MO	24
19	40	4	MO	24

Allocation objective:

River Sport: NA

KMZ Sport: NA

Tribes: 0.5

Klamath escapement buffer: 0
